

CLAIMS

What is claimed is:

1. A method of improving reverse link communications at a Radio Base Station (RBS) providing a plurality of radio sectors, the method comprising:
forcing always-softer reverse link handoff conditions at the RBS for mobile stations served by the RBS based on assigning one or more additional reverse links from remaining sectors of the RBS if a reverse link is assigned to a mobile station from a serving sector of the RBS; and
combining reverse link signals from the assigned reverse links to obtain a combined reverse link signal for the mobile station.
2. The method of claim 1, wherein combining reverse link signals from the assigned reverse links to obtain a combined reverse link signal for the mobile station comprises performing maximum ratio combining of the reverse link signals.
3. The method of claim 1, further comprising assigning the one or more additional reverse links irrespective of whether the corresponding sectors are suitable for forward link assignments to the mobile station.
4. The method of claim 1, further comprising assigning the one or more additional reverse links irrespective of whether the corresponding sectors are included in a current active set of the mobile station.

5. The method of claim 1, wherein forcing always-softer reverse link handoff conditions at the RBS for mobile stations served by the RBS based on assigning one or more additional reverse links from remaining sectors of the RBS if a reverse link is assigned to a mobile station from a serving sector of the RBS comprises:
 - determining whether any reverse link supplemental channel (R-SCH) is assigned to the mobile station; and
 - forcing the always-softer reverse link handoff condition if a R-SCH is assigned to the mobile station and not forcing the always-softer reverse link handoff condition if no R-SCH is assigned to the mobile station.
6. The method of claim 5, further comprising forcing the always-softer reverse link handoff condition at the RBS for any reverse link fundamental channel (R-FCH) assigned to the mobile station in conjunction with forcing the always-softer reverse link handoff condition at the RBS for any R-SCH assigned to the mobile station.
7. The method of claim 1, further comprising causing the mobile station to reduce a reverse link transmit power in conjunction with implementing the always-softer handoff to account for improved reception quality of the combined reverse link signal.
8. The method of claim 7, wherein causing the mobile station to reduce a reverse link transmit power in conjunction with implementing the always-softer reverse link handoff comprises causing the mobile station to reduce a transmit gain of a reverse link supplemental channel signal transmitted by the mobile station to the RBS on the assigned reverse links.

9. The method of claim 1, further comprising increasing a finger search window used by RAKE receiver radio circuits at the RBS in conjunction with forcing the always-softer reverse link handoff condition at the RBS.

10. A Radio Base Station (RBS) having a plurality of radio sectors, the RBS comprising:

a handoff control circuit configured to implement always-softer reverse link handoff at the RBS by assigning one or more additional reverse links from remaining sectors of the RBS if a reverse link is assigned to a mobile station from a serving sector of the RBS; and
a combining circuit to combine reverse link signals from the assigned reverse links to obtain a combined reverse link signal for the mobile station.

11. The RBS of claim 10, wherein the combining circuit employs maximum ratio combining to combine the reverse link signals from the assigned reverse links.

12. The RBS of claim 10, wherein the handoff control circuit is configured to assign the one or more additional reverse links irrespective of whether the corresponding sectors are suitable for forward link assignments to the mobile station.

13. The RBS of claim 10, wherein the handoff control circuit is configured to assign the one or more additional reverse links irrespective of whether the corresponding sectors are included in a current active set of the mobile station.

14. The RBS of claim 10, wherein the handoff control circuit is configured to implement always-softer reverse link handoff based on determining whether any reverse link supplemental channel (R-SCH) is assigned to the mobile station, implement the always-softer reverse link handoff if a R-SCH is assigned to the mobile station, and not implement the always-softer reverse link handoff if no R-SCH is assigned to the mobile station.

15. The RBS of claim 14, wherein the handoff control circuit is configured to implement the always-softer reverse link handoff at the RBS for any reverse link fundamental channel (R-FCH) assigned to the mobile station in conjunction with implementing the always-softer reverse link handoff at the RBS for any R-SCH assigned to the mobile station.

16. The RBS of claim 10, wherein the RBS is configured to use an increased finger search window for one or more RAKE receiver radio circuits used at the RBS for receiving the reverse link signals from the mobile station in conjunction with forcing the always-softer reverse link handoff condition for the mobile station.

17. A method of improving reverse link communications at a Radio Base Station (RBS) having a plurality of radio sectors, the method comprising:
 - selecting a first sector of the RBS as a serving sector for a mobile station and assigning forward and reverse links to the mobile station at the serving sector;
 - selectively forcing an always-softer reverse link handoff condition for the mobile station at the RBS by assigning one or more additional reverse links to the mobile station at one remaining sectors of the RBS; and
 - combining the reverse link signals from the mobile station from the assigned reverse links to form a combined reverse link signal.
18. The method of claim 17, further comprising transmitting the combined reverse link signal over a backhaul link to a supporting Base Station Controller (BSC).
19. The method of claim 17, further comprising making forward link assignments independently of assigning the one or more additional reverse links to the mobile station.
20. The method of claim 17, wherein selectively forcing an always-softer reverse link handoff condition for the mobile station at the RBS by assigning one or more additional reverse links to the mobile station at one remaining sectors of the RBS comprises:
 - implementing always-softer reverse link handoff for the mobile station if any reverse link supplemental channels (R-SCHs) are being used for the mobile station, and not
 - implementing always-softer reverse link handoff for the mobile station if no R-SCHs are being used for the mobile station.

21. The method of claim 20, further comprising if the always-softer reverse link handoff condition is forced for any R-SCHs associated with the mobile station, then forcing the always-softer reverse link handoff condition for any reverse link fundamental channel (R-FCH) associated with the mobile station.

22. The method of claim 17, further comprising causing the mobile station to reduce a reverse link transmit power if the always-softer reverse link handoff condition is forced for the mobile station.

23. The method of claim 22, wherein causing the mobile station to reduce a reverse link transmit power if the always-softer reverse link handoff condition is forced for the mobile station comprises causing the mobile station to reduce a transmit gain of a reverse link supplemental channel signal transmitted by the mobile station to the RBS on the assigned reverse links.

24. The method of claim 17, further comprising increasing a finger search window used by RAKE receiver radio circuits at the RBS for receiving reverse link signals from the mobile station to account for potentially greater reverse link signal dispersion at the RBS arising from forcing the always-softer reverse link handoff condition.